Abstract

Title: Polyethylene molding material and pipe produced therewith with improved mechanical properties

The invention relates to a polyethylene molding material having a bimodal molecular weight distribution which has an overall density of ≥ 0.948 g/cm^3 and a melt flow index $MFI_{190/5}$ of ≤ 0.2 dg/min. It comprises an amount of from 35 to 65% by weight of low-molecular-weight ethylene homopolymer A which has a viscosity number VN_A in the range from 40 to 90 cm^3/g, a melt flow index $MFI_{190/2.16\ A}$ in the range from 40 to 2000 dg/min and a density d_A of ≥ 0.965 g/cm^3, and an amount of from 35 to 65% by weight of high-molecular-weight ethylene copolymer B which has a viscosity number VN_B in the range from 500 to 2000 cm^3/g, a melt flow index $MFI_{190/5\ B}$ in the range from 0.02 to 0.2 dg/min and a density d_B in the range from 0.922 to 0.944 g/cm^3. The fraction of the molding material according to the invention obtained during a preparative TREF analysis at a temperature of 78°C ± 3 K using p-xylene has an average molecular weight of ≥ 200,000 g/mol.

The invention also relates to a high-strength pipe produced from the molding material according to the invention which has a stress cracking resistance of ≥ 1500 h, a fracture toughness of ≥ 9 mJ/mm^2 and a flexural creep modulus, measured in accordance with DIN 54852-Z4, of ≥ 1350 N/mm^2. It is particularly suitable for the transport of gases and water.

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